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ON THE

FŒTUS IN UTERO,

AS

INOCULATING THE MATERNAL WITH THE PECULIARITIES
OF THE PATERNAL ORGANISM;

AND

ON THE INFLUENCE THEREBY EXERTED BY THE MALE ON THE
CONSTITUTION AND THE REPRODUCTIVE POWERS
OF THE FEMALE.

BY

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ON THE FŒTUS IN UTERO, ETC.

INSTANCES are sufficiently common among the lower animals, where the offspring exhibit, more or less distinctly, over and beyond the characters of the male by which they were begotten, the peculiarities, also, of a male by which their mother had at some former period been impregnated,—or, as it has been otherwise expressed, where the peculiarities of a male animal that has once had fruitful intercourse with a female, are more or less distinctly recognised in the offspring of subsequent connections of that female with other males.¹ A young chestnut mare, seven-eighths Arabian, belonging to the Earl of Morton, was covered in 1815, by a quagga, which is a species of wild ass from Africa, and marked somewhat after the manner of the zebra. The mare was covered but once by the quagga; and, after a pregnancy of eleven months and four days, gave birth to a hybrid which had distinct marks of the quagga, in the shape of its head, black bars on the legs and shoulders, &c. In 1817, 1818, and 1821, the same mare (which had in the meantime passed into the possession of Sir Gore Ouseley), was covered by a very fine black Arabian horse, and produced, successively, three foals, all of which bore unequivocal marks of the quagga.² Several other examples illustrative of the general fact above stated will presently be given.

Great difficulty has been felt by physiological writers in regard to the proper explanation of this kind of phenomena. They have been ascribed by some to a permanent impression made somehow by the semen of the first male on the genitals, and more particularly on the ova, of the female; and by others to an abiding influence exerted by him on the imagination of the female, and operating on her mind at the time of her connection subsequently with other males, and perhaps during her pregnancy. But they seem to be regarded by most physiologists as inexplicable.

¹ Alison, *Outlines of Physiology*, 3d Ed., p. 443.

² *Philosophical Transactions*, 1821, p. 20; *Dunglison's Human Physiology*, 3d Ed., vol ii., p. 387.

Very recently, in a paper published in the "Aberdeen Journal,"¹ an intelligent veterinary surgeon, Mr James M'Gillivray, of Huntly, has offered an explanation, which seems to me to be the true one. His theory is set forth in the following statements quoted from that paper:—"When a pure animal of any breed has been pregnant to an animal of a different breed, such pregnant animal is a cross ever after; *the purity of her blood being lost*, in consequence of her connection with the foreign animal;" and again: "If a cow, say of the pure Aberdeenshire breed, is in calf to a bull of the short-horn breed (known as the Teeswater breed), in proportion as this calf partakes of the nature and physical characters of the bull, just in proportion will the *blood* of the cow become *contaminated*, and herself a cross, for ever incapable of producing a pure calf of any breed." "It is maintained, therefore (Mr M'Gillivray adds), that the great variety of non-descript animals to be met with are the result of the crossing system; the prevailing evil of which is, the admission of bulls of various breeds to the same cow, *whereby the blood is completely vitiated*."

In explanation of his theory, Mr M'Gillivray enters into particulars as to the nature of the connection subsisting between the fœtus in utero and its mother, with the view of showing (what seems to him essential to the validity of the theory) that there is a *direct* vascular communication between the two; and that, while a portion of the mother's blood is continually passing by direct transmission into the body of the fœtus, the latter returns to the former so much of that blood as is not needed by it, and that this superfluous blood, after circulating through the system of the fœtus, passes as directly into the system of the mother, and, commingling with the rest of her blood, *destroys its purity, contaminates, vitiates it*.

Mr M'Gillivray is quite wrong, I apprehend, in assuming that there is, in any case, a direct vascular connection between the fœtus and its mother. Nor does the assumption appear to me at all necessary to establish the theory. But waiving, for the present, all discussion of that point, it may here be observed that Mr M'Gillivray regards the influence exerted by the male on the female animal, through the medium of the fœtus, as *constitutional*; and perhaps the best general expression of the theory is, that the fœtus, partaking, as it must, of the characters or peculiarities of its father, *inoculates* therewith the blood, and, generally, the system, of its mother.

The subject now opened up is certainly one of great interest in general physiology, as well as of considerable practical importance to breeders. It cannot but be interesting to inquire whether the fact instanced in Lord Morton's mare, is or is not a general law in animal physiology; and, if it be, whether and how far it is modified, in its operation, in different animals, and under different circum-

¹ March 21 and 23, 1849.

stances. But to the human physiologist, and to the physician, it is of more immediate interest to inquire whether or not the fact extends also to his own species; and, if it does, to ascertain how far it applies, and whether it does not admit of illustration by, and serve itself, in its turn, to illustrate certain known facts in regard to the communication and the constitutional effects of the syphilitic and other morbid poisons, the scrofulous diathesis, &c. And, in particular, it can hardly fail to suggest some such curious questions as the following, viz. :—

1st, Whether, in the case of a woman who has been twice married, and borne children to both husbands, the children borne to the second husband ever, or generally, partake of the peculiarities of the first husband.

2nd, Whether, in a family of several children, the younger children rather than the elder, are disposed, *cæteris paribus*, to exhibit the characters of the father.

3d, Whether a woman who has borne several children by the same husband, may not ultimately acquire some of the physical characters, or at least imbibe and manifest some of the morbid tendencies, of the latter.

In treating farther of this singular subject, I shall *first* state the facts at present known to me regarding it; and, *secondly*, consider the theories offered in explanation of it.

I. In regard to the facts of the subject, these will be most conveniently noticed, *first*, in relation to the lower animals; and, *secondly*, in relation to the human species.

(1.) As regards the brute creation :—Besides the instance already quoted of the mare belonging to Lord Morton, there is another similar case recorded. A mare belonging to Sir Gore Ouseley, was covered by a zebra, and gave birth to a striped hybrid. The year following, the same mare was covered by a thorough-bred horse, and the next succeeding year by another horse. Both the *foals* thus produced were striped, *i.e.*, partook of the characters of the zebra.¹ And it is stated by Haller, and also by Becker, that when a mare has had a *mule* by an ass, and afterwards a *foal* by a horse, the foal exhibits traces of the ass.²

In the foregoing cases, the mares were covered, in the first instance, by animals of a different species from themselves. But cases are recorded of mares covered in every instance by horses, but by different horses, on different occasions—where the offspring partook of the characters of the horse, by which impregnation was first ef-

¹ M'Gillivray, "Aberdeen Journal," March 28, 1849. Paintings of these animals and their skins are said to be preserved in the Museum of the Royal College of Surgeons of England.

² Haller, *Element. Physiol.*, viii., p. 104, ; Becker, *Physic. Subterranean*. Lips., 1703. Quoted from Dunglison's *Physiology*, vol. ii., p. 387.

fect. Of this Mr M'Gillivray gives two examples. Thus, in several foals, in the Royal stud at Hampton Court, got by the horse *Actæon*, there were unequivocal marks of the horse *Colonel*,—the dams of these foals were bred from by Colonel the previous year. Again, a colt, the property of the Earl of Suffield, got by *Laurel*, so resembled another horse *Camel*, "that it was whispered, nay, even asserted, at New-Market, that he must have been got by Camel." It was ascertained, however, that the mother of the colt was covered, the previous year, by Camel.

It has often been observed, also, that a well-bred bitch, if she have been impregnated by a mongrel-dog, will not, although lined subsequently by a pure dog, bear thorough-bred puppies in the next two or three litters.¹

The like occurrence has been noticed in respect of the sow. A sow of the black and white breed (known as Mr Western's breed) became pregnant by a boar of the wild breed, of a deep chestnut colour. The pigs produced were duly mixed, the colour of the boar being in some very predominant. The sow being afterwards put to a boar of the same breed with her own, some of the produce were observed to be stained or marked with the chestnut colour that prevailed in the former litter. And, on a subsequent impregnation, the boar being still of the same breed as the sow, some of the litter were also slightly marked with the chestnut colour. What adds to the value of the fact now stated is, that in the course of many years' observation, the breed in question was never known to produce progeny having the smallest tinge of the chestnut colour.²

Breeders of cattle are familiar with analogous facts as occurring in the cow. A pure Aberdeenshire heifer was served with a pure Teeswater bull, to whom she had a *first-cross* calf. The following season, the same cow was served with a pure Aberdeenshire bull; the produce was a *cross* calf, which at two years old had very long horns, the parents both hummel.³ A pure Aberdeenshire cow was served, in 1845, with a cross bull—*i. e.*, an animal produced between a first-cross cow and a pure Teeswater bull. To this bull she had a cross calf. Next season she was served with a pure Aberdeenshire bull,—the calf was quite a *cross* in shape and colour.⁴

Mr M'Gillivray, after narrating the whole of the foregoing ex-

¹ Kirkes' Handbook of Physiology, p. 613.

² Philosophical Transactions for 1821, p. 23. "Apart from a state of domestication," says Mr M'Gillivray, "I do not believe that there is one solitary instance in which an animal has produced offspring of various colours. Animals, left entirely to the operation of natural causes, never exhibit this sporting of colours; they are to be distinguished by various and often beautiful shades of colour; but then each species is true to its own family type, even to a few hairs or small parts of a feather."

³ M'Gillivray, loc. cit.

⁴ M'Gillivray, loc. cit.

amples, says :—"Many more instances might be cited, did time permit. *Among cattle and horses they are of every day occurrence.*"

(2.) As regards the human species. The facts bearing on this division of the subject are exceedingly few, and not to be relied on; and the observations which follow are intended rather to suggest and direct, than to satisfy, inquiry.

Dr Allen Thomson, in his article on generation, in the "Cyclopædia of Anatomy and Physiology," remarks :—"It is affirmed that the human female, when twice married, bears occasionally to the second husband, children resembling the first, both in bodily structure and mental powers." And Dr George Ogilvie, of this city, informs me of a case, which fell under his own observation, where a woman was twice married, and had children by both husbands, and where the children by both marriages were scrofulous, although only the first husband had marks of that diathesis; the woman herself, and her second husband, being to all appearance quite healthy.

Dr Ogilvie's case is clearly beset by so many sources of fallacy, that we cannot venture at present to regard it as a case in point. Dr Thomson does not bring forward any instances, nor offer any proof, in support of his statement; and, indeed, he gives it, without saying whether he thinks it well or ill-founded. Any such statement, it is plain, based on observation of the children of European parents—*i. e.*, where the female and both her husbands and their children are all white—must be comparatively difficult of verification; but it is equally plain that means exist for subjecting it to a pretty decisive test. There are equally distinct breeds of the human family as of any of the lower animals; and all that seems requisite in regard to determining the question under consideration is, to observe accurately, whether the children of European parents, where the woman has, in the first instance, had offspring by a negro, exhibit traces of the latter in the colour of the skin, the form of the features, &c.; or, *vice versâ*, whether the children of negro parents, where the woman had, first of all, been impregnated by a European, exhibit the peculiarities of the latter. Of the former case, a medical friend informs me that he recollects hearing of an instance of the kind as occurring in this neighbourhood, but cannot vouch for the truth of it. Of the latter case, if the general fact applies to the human species, instances must abound in our West India colonies, in the United States of America, and in other parts of the world. My colleague Dr Dyce tells me, that he has certainly known one instance (if not more) where a creole woman bore fair children to a white man; and that the same woman had afterwards to a creole man other children, who bore much resemblance to the white man, both in features and in complexion. But two very intelligent friends—the one a West India proprietor, the other a medical man—both long resident in Jamaica, tell me that they never noticed, nor ever heard of an in-

stance of the kind, although connections of that sort are common there, and children born under such circumstances very numerous. It is singular, indeed, if instances of the fact in question do occur, and still more if they are of frequent occurrence, that they should not be notorious. It is conceivable, however, and by no means improbable, that cases do exist, but that they have been overlooked from the traces of the European being so minute as to escape ordinary observation, and the fact have remained unknown from special attention never having been directed to it.

If the male does exert any such influence as is here in question on the constitution and the reproductive powers of the female, it is conceivable that, by each successive impregnation effected by him, that influence may be increased; and, if so, the younger children begotten by him, rather than the elder, might be expected, *cæteris paribus*, to bear their father's image. And this more special fact, if ascertained, would establish also the more general one. I am not aware, however, of any specific facts bearing upon it, nor of any popular notions regarding it. But my colleague Dr Laing is cognisant of the case of an English gentleman who had a large family by a negro woman, in the West Indies, and where the children successively exhibited more and more the European features and complexion.

But, however this may be, there is a popular belief that, in the course of years, a woman comes to resemble her husband, and that not merely in respect of temper, disposition, or habits of thought, but in bodily appearance. But, in so far as the notion may hold good, it may be true only of the features, and of these only as they indicate or bespeak the inward feelings of the mind, which, from long and familiar intercourse, may, to a certain extent, become common to man and wife. In so far as the notion is true in any other respect, and the parties have had several children, it may suggest the question, whether the assimilation is not referable to an influence exerted by the husband, through the medium of the fœtus in utero, on the constitution of the wife? The question is probably an idle one, and the notion only a popular error. In so far, however, as there is anything in it, the explanation suggested gives a peculiar, and it may be added, a physiological significance, to the language of Scripture relative to man and wife, at least when their intercourse has been fruitful—"They twain shall be *one flesh*."

It is of more immediate interest, however, and of greater practical moment, to ascertain whether, through the medium of the fœtus, the husband may impart to his wife either the syphilitic virus, or the scrofulous diathesis, or any other constitutional morbid tendency (*e.g.* insanity) which he may possess. Facts are wanting on this subject; but it is not undeserving of patient inquiry. Dr Ogilvie's case, formerly referred to, if it could be relied on, would be an instance of it. Before the mother could have imparted the sero-

fulous taint to her offspring by the second husband, she must herself have imbibed it from her first husband through the medium of his offspring while in utero. And, although still seemingly free of the taint, it may have required only the appropriate external conditions to call it into full activity in her own person. And, with regard to the syphilitic poison, there is no difficulty in understanding, and it is quite within the bounds of probability, that the fœtus, if contaminated with it by its father, may convey it to the mother. Messrs Maunsell and Evanson, after mentioning that they have notes of the case of a syphilitic child, whose mother had been infected by a former husband (they do not say in what way)—and to all appearance cured five years before its birth—the father of the child (her second husband) being in good health, state that their experience would enable them to adduce many curious facts bearing on the communication of the syphilitic poison.¹ Perhaps their experience might furnish an affirmative solution of the question at issue. It has been affirmed, indeed, that a man who has once had syphilis, but been seemingly cured of it for many years, may yet so retain the taint of it as to contaminate his offspring, without, at the same time, tainting his wife. Very possibly. But this does not prove that he may not contaminate his wife also; and the observation itself is in that respect fallacious, inasmuch as in any given case of the kind, the wife may really have imbibed the virus, although in a latent form, and might subsequently give proof of the reality of the fact by tainting the offspring begotten by another and a perfectly healthy husband. Adopting this view, it may be found of importance, in contemplating marriage with a widow, to inquire into the constitutional peculiarities of her deceased husband!

II. Of the general fact now under consideration, and clearly established in respect of the lower animals, only two explanations, that are at all rational, have been offered. The first is that suggested by the great Haller, who ascribes it to a permanent impression made by the semen of the male on the genitals, and more particularly on the ova, of the female; the second, that suggested by Mr M'Gillivray, who ascribes it to an influence exerted by the fœtus in utero on the constitution of the mother. The notion entertained by Sir Everard Home and others, that it is an affair of the imagination, seems too absurd to require serious consideration.

Haller's knowledge of the subject appears to have been very limited, and his explanation of it to have been offered incidentally. He was aware that when a mare has had a mule by an ass, and afterwards a foal by a horse, the foal exhibits traces of the ass; and he remarks, "that the female organs of the mare seem to be corrupted by the unequal copulation with the ass,"² *i. e.* that the semen of the latter

¹ On the Management and Diseases of Children, 5th edit. pp. 452-3.

² Dunglison's Physiology, vol. ii. p. 387.

exerts an influence on the genitals, and, of course, on the ova of the mare, which appears subsequently on the impregnation of these ova by males of her own species.¹

It may be stated, in support of Haller's theory, that, in the case of birds, a single intercourse is known to impregnate many eggs which are laid successively after it; but, on the other hand, the influence of such intercourse extends only to the eggs of one season, or rather of one brood,—the several eggs being laid in tolerably quick succession, and all of them probably in a state of maturity, and actually impregnated at the time of that intercourse. This fact, therefore, goes but a short way to favour Haller's theory, and may, indeed, be said to tell as much against as for it. And if it shall be clearly ascertained (as seems presently to be the belief of physiologists), that any single ovum remains but a short time in the ovary, Haller's theory must be given up. But even if it could be shown that an ovum may remain in the ovary for a series of years, the fact would be of little value, unless it could also be shown that the semen can exert some definite kind of influence on an ovum, which it does not at the time actually impregnate. There seems little probability, however, of this being done; and there is one fact known in regard to the ova which makes it difficult to conceive it possible—the fact, namely, that unripe or unripe ova lie deeply imbedded in the stroma of the ovary.

Mr M'Gillivray's theory seems to me to meet the whole facts of the case, and to derive support from a great variety of facts in regard to the reception and constitutional effects of morbid poisons and morbid diatheses.

Mr M'Gillivray, indeed, supposes, as was formerly noticed, that there is a *direct* vascular connection between the fœtus in utero and its mother; and he seems to consider the validity of his theory to hinge on this assumption. The assumption, however, is untenable, nor is it at all necessary for the establishment of the theory. The researches of Dr John Reid and of Mr Goodsir, on the structure of the placenta, have demonstrated that the connection is *indirect* only—the fœtus and the mother imbibing materials from each other, very much in the same way that the lacteal vessels take up the nutritive portions of the food in its transit along the small intestines; or that the roots and leaves of vegetables take up nourishment from the soil and the atmosphere,—the materials imbibed, in each case, passing through a pervious, but not a perforated, tube or membrane, and being taken up by a real act of *absorption*, during which act they are more or less altered in their character, or *assimi-*

¹ Dr Kirkes also appears to regard the cause as a local one. Referring to Lord Morton's case, he observes,—“The single impregnation, by the seminal fluid of the quagga, had impressed its character not only on the ovum then impregnated, but on the three following ova impregnated by horses.”—Hand-book of Physiology, p. 614. Such, too, is Mr Mayo's view. Physiology, 2d Ed., p. 490.

lated. But, independently of the considerations now stated, it appears from the observations of Prevost and Dumas, and of others, that the corpuseles of the foetal blood are differently shaped from, and, in the later stages, larger than those of the mother¹—a fact which shows, at least, that no entire corpuseles of blood are transmitted from the one to the other, and, indeed, taken in connection with the facts ascertained as to the structure of the placenta, proves that it is by *transudation* only, that the contents of the uterine and foetal vessels mutually pass into each other.

In so doing, the materials in question are more or less altered in their character, or undergo what physiologists term a process of *assimilation*. In the case of the lacteal vessels, the chyle which they contain can never be detected *as such* in the alimentary mass; nor is the sap of vegetables precisely the same fluid that exists in the soil and in the air. In like manner, the blood in the umbilical vessels, doubtless differs from that existing in the uterine sinuses. At the same time, the assimilating process does not go the length probably in any case of wholly changing the character of the fluids concerned in it; and there is reason to believe, that, in different cases, it proceeds to a very different extent—in some the change effected being to a less extent than in others. And possibly, in the case of the foetus and its mother, the amount of the assimilation is not considerable. No interchange of corpuseles takes place, but in respect of the other constituents of the blood, it is difficult to conceive why they should not be transmitted nearly unchanged. Professor Simpson, of Edinburgh, has recently shown that the small-pox virus may pass unaltered from the mother to the child in her womb, and produce in it the actual disease, even although, by reason of previous vaccination, the mother may herself remain unaffected by it.² And a similar fact has long been known in regard to the transmission of the syphilitic virus from the mother to the foetus in utero.

We can, therefore, have no difficulty in understanding, in respect of the foetus itself, that, although its connection with the mother is indirect only and merely to the extent of allowing the passage of the *liquor sanguinis*, and although this may even be so far altered in the passage, the constitutional peculiarities, derived to it from its father, and inherent in its blood, may, with the blood, be imbibed by its mother. And when we reflect on the length of time during which the connection between them is kept up, the amount and the activity of interstitial change continually going on in the system of the foetus, the large quantity of foetal blood that must eventually be taken into the vessels of the mother, and the probability that the peculiar matter imparted by the male parent to the

¹ Alison, *Outlines of Physiology*, 3d edit. p. 426.—Kirkes' *Handbook*, pp. 66-7.

² *Edinburgh Monthly Journal of Medical Science* for April 1849.

ovum at the moment of impregnation (be its nature what it may, and its quantity never so infinitesimal), assimilates, like a ferment, much of the foetal blood to itself, it does not seem too hard to be believed that the blood and constitution generally of the mother may, thereby, become so imbued with the peculiarities of that parent, as to impart them to any offspring she may subsequently have by other males.

ABERDEEN, April 30, 1849.

APPENDIX.

I. In the foregoing paper a question occurs as to whether, in the case of a woman who has been twice married, and borne children by both husbands, the children of the second marriage ever resemble the mother's first husband (p. 5).

The following additional cases, illustrative of this question, have recently been communicated to me: the first by my friend the Rev. Charles M'Combie, of Tillyfour, minister of Lumphanan, in Aberdeenshire; the second by Professor Simpson, of Edinburgh; and the third by Professor Pirrie, of Aberdeen:—

1. Mrs ———, a neighbour of Mr M'Combie, was twice married, and had issue by both husbands. The children of the first marriage were five in number; of the second, three. One of these three, a daughter, bears an unmistakeable resemblance to her mother's first husband. What makes the likeness the more discernible is, that there was the most marked difference, in their features and general appearance, between the two husbands.

2. A young woman, residing in Edinburgh, and born of white (Scottish) parents, but whose mother sometime previous to her marriage had a natural (mulatto) child, by a negro man-servant, in Edinburgh, exhibits distinct traces of the negro. Dr Simpson, whose patient the young woman at one time was, has had no recent opportunities of satisfying himself as to the precise extent to which the negro character prevails in her features; but he recollects being struck with the resemblance, and noticed particularly that the hair had the qualities characteristic of the negro.

3. Mrs H——, apparently perfectly free from scrofula, married a man who died of phthisis. She had one child by him, which also died of phthisis. She next married a person who was to all appearance equally healthy as herself, and had two children by him, one of which died of phthisis, the other of tubercular mesenteric disease—having, at the same time, scrofulous ulceration of the under extremity.

II. In connection with the constitutional influence exerted by the male, through the medium of the foetus in utero, on the system of the female, another and a very singular question may be raised. In the case of an aboriginal woman of colour, does previous impregnation by an European male render the female incapable ever after of fruitful intercourse with a male of her own race?

This question is suggested by an observation, made in various parts of the world, by the excellent Count de Strzelecki, relative to the effect of fruitful intercourse between an aboriginal female and an European male. "*Whenever such intercourse takes place,*" says the Count, "*the native female is found to lose the power of conception on a renewal of intercourse with the male of her own race, retaining only that of procreating with the white men.*"¹

This, if a general fact, contrasts remarkably with Dr Simpson's case, above-mentioned (one of fruitful connection between a white man and a white woman, after previous impregnation of the latter by a black man), unless, indeed, this be, which probably it is not, an exception to an equally general fact of the same sort. It would limit, also,—nay, absolutely exclude, opportunities of observing whether children born of dark parents, where the mother formerly had issue by a European male, exhibit traces of the latter. But it was before stated (pp. 7, 8), on the authority of two gentlemen long resident in Jamaica, that in our West India colonies—in Jamaica, at least,—fruitful connections of this kind are of common occurrence, and (which I mention at present as in keeping with this) on the authority of Dr Dyce, that, in children born under such circumstances, marks of the European have been observed. Special inquiry, made recently, has served so far to confirm these statements, but not to satisfy me that the issue of such connections is numerous.

The opportunities, however, enjoyed by the Count de Strzelecki, of making observations as to this point, in most parts of the new world, have been very great. "He has lived much (to use his own words) amongst different races of aborigines,—the natives of Canada, of the United States, of California, Mexico, the South American Republics, the Marquesas, Sandwich, and Society Islands, and those of New Zealand and Australia."² And, referring to the statement made by him, and already quoted, the Count observes—"*Hundreds of instances of this extraordinary fact are on record in the writer's memoranda, all recurring invariably under the same circumstances,* amongst the Hurons, Seminoles, Red Indians, Yakies (Sinaloa), Mendosa Indians, Araucos, South Sea Islanders, and natives of New Zealand, New South Wales, and Van Dieman's Land; and all tending to prove that the sterility of the female, which is relative only to one and not to another male, is not accidental, but follows laws as cogent, though as mysterious, as the rest of those connected with generation."³

Strzelecki does not state to what extent, or indeed whether, he has met with exceptional cases, *i. e.*, cases where, after connection of the kind in question, fruitful intercourse has taken place between a native man and woman. This it would be important to know.

¹ Physical Description of New South Wales and Van Dieman's Land, p. 347.

² Op. cit. p. 345.

³ Op. cit. p. 347.

It seems not improbable, at least, that such cases may have been observed by him. They would not, indeed, even were they numerous, invalidate the inference obviously drawn by him from his other observations, provided they were really exceptional. They would merely show that the fact does not hold universally or absolutely. But should the inference be in the meantime disputed, as I think it well may, it can only be determined, in the affirmative, by proofs of the same general kind with those by which (for example) the contagious property of certain diseases is established,—to wit, by comparative observations on the large scale, showing,—*first*, that native females who have once had fruitful connection with European males, are, subsequently, as compared with other native females who have had no such connection, much less fruitful with males of their own race; and, *secondly*, that no other common circumstance, save that of such connection, can be ascertained to exist in the case of most of the women that become barren, and not to exist in the case of most of those that are fruitful.¹

If future inquiry thus directed shall verify the inference, which at present can only be regarded as an hypothesis, it will establish a general principle in the physiology of generation of the highest interest and importance. Assuming, however, that it is well-founded, and will hereafter be proved to be a fact, it were vain, perhaps, in the present state of our knowledge, to attempt an explanation of it; but, with regard to its bearing on the subject of this paper, I am inclined to think, from the facts already adduced in these pages—uncertain as some of them may be—that the sterility is quite as likely to be owing to the *system* of the female being somehow altered or affected, during her pregnancy, by the fœtus begotten by the European, as to a *local* change in the general mass of ova effected by the mere act of intercourse, *i. e.*, the mere application to them of the semen of the European. Our knowledge, indeed, of the conditions essential to impregnation, and of the mode in which it is accomplished, does not warrant us to say that the change cannot be exclusively local. But the facts ascertained of late years, as to immature ova occupying the *centre* of the ovary,—as to the ova undergoing a process of maturation and coming to the surface of the ovary, prior to, and in order to, impregnation,—and as to the mature ova passing off at each monthly period, and becoming blighted when not impregnated, tend rather to set aside the notion of local affection, and therefore to give probability to the other view. And if this other view should be established, the fact itself would clearly furnish additional testimony to the doctrine, and would merge in the still more general fact, that the fœtus in utero does *inoculate* the system of the female with the peculiarities of that of the male.

The alleged relative sterility of the native female, after intercourse

¹ See Alison's Outlines of Pathology and Practice of Medicine, p. 67.

with the European male, is brought forward (it may be added) by Strzelecki as affording an explanation, and as being the chief cause, of the gradual diminution and ultimate extinction of the native tribes in most parts of the new world, which follow the introduction of the European races. "Wherever the white man has set his foot-mark, there the print of the native foot is obliterated; and as the tender plant withers beneath his tread, so withers the aboriginal inhabitant of the soil."¹ And "human interference," says Strzelecki, "to avert this melancholy consequence has been hitherto of no avail;—a charter for colonisation granted to one race becomes virtually the decree for the extinction of the other."²

Very various causes, doubtless, concur to bring about this result. The one assigned by Strzelecki as the chief is obviously quite adequate, if a real one, to its production. And should his belief as to the reality of this cause be confirmed, and if it shall farther appear, that the principle involved in it applies only to aboriginal females contaminated by European males, and not to European females contaminated by aboriginal males, *i. e.*, should the former class of females only, and not the latter, be rendered sterile to males of their own race by such foreign intercourse, the discovery can scarcely fail, not merely to exhibit the predominancy of the white over the dark races of men, in a particular not previously suspected, but to indicate that the designs of Providence, in regard to the human family in this stage of existence, embrace the ultimate extinction of the primitive varieties of the dark races. Their physical peculiarities and their social degradation—a mystery, if not a standing memorial of a curse visited on their progenitors, in the times of miraculous interposition; the purpose of their existence in respect of this earth—a mystery also, yet somehow subservient, seemingly, to that of their more favoured *brethren*;—their end, after that purpose is served—extirpation? But these are questions which, besides, that they are foreign to the object of this paper, are, perhaps, too deep for human penetration.

July, 1849.

¹ Brooke's Narrative of Events in Borneo and Celebes, vol. i. p. 12.

² Strzelecki records the following remarkable circumstance which came within his own personal knowledge:—A party of aborigines in Van Dieman's Land, to the number of 210, were deported by government in 1835 to Flinder's Island, on account of aggressions made by them on the colonists in their neighbourhood, by whom, however, they had been contaminated. They had only 14 children born among them during the next seven years. It is true, that, in the course of that time, their own numbers had dwindled away to 54. Still the small number of births is singular, and contrasts strikingly with the fact, that "each family, in the interior of New South Wales, uncontaminated by contact with the whites, *swarms with children*." (Op. cit. pp. 350-5.)

